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ABSTRACT

A study was conducted to explore the developmental differences in utilizing a superordinate context during learning and to examine the stability of the advantage of a superordinate context at retention across grade level. Ss were 98 students from third and fifth grade classes, who were divided approximately evenly by sex. A 2 x 2 x 2 factorial design was used; factors one and two were learning and retention treatments; factor three was grade level. Ss were tested on retention, recognition, and recall. Contrary to previous findings, results showed that the condition most conducive to learning was topic sentence present at learning, absent at recall. Reasons for the disparity in findings are discussed. (CK)

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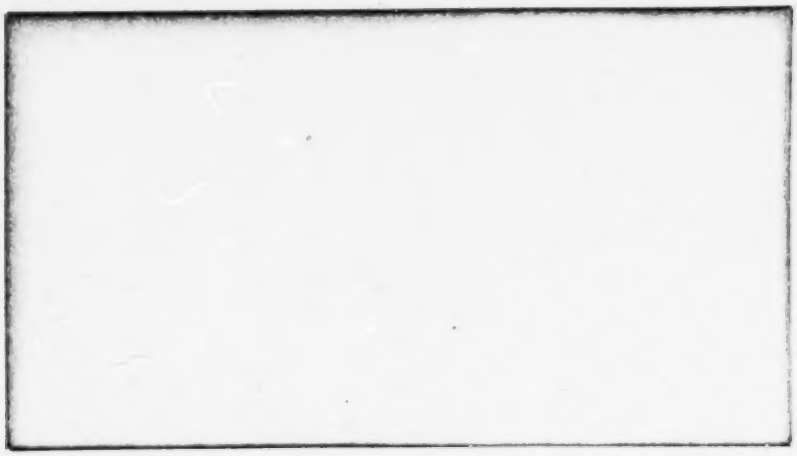

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Gagne (1969) compared the relative effectiveness of providing a superordinate context for the learning and retention of facts and found, among other things, that providing a "topic sentence" that organized following sentences was more effective than a condition in which co-ordinate sentences (other facts) were substituted for the topic sentence. In a later study, Gagné and Weigand (1970) compared superordinate and co-ordinate manipulations at both learning and retention. In contrast to the earlier study, there was no advantage for the superordinate context at learning but providing a superordinate context at retention did result in significantly higher fact recognition. Gagné and Weigand (1970) accounted for the discrepant results by noting that the Gagné (1969) study had used both fourth and fifth grade Ss while the Gagné and Weigand (1970) study has used only fourth graders. The superordinate/co-ordinate differences at learning were substantial for fifth graders but not fourth graders in the Gagné (1969) study. The present study was designed to explore the developmental differences in utilizing a superordinate context during learning and to examine the stability of the advantage of a superordinate context at retention across grade level. To accomplish this the Gagné and Weigand (1970) study was replicated with third and fifth grade Ss.

Method

Subjects

Ninety-eight students from third and fifth grade classes at two elementary schools in a midwestern community were the subjects. The groups were divided approximately evenly by sex, and Ss were randomly assigned to one of four experimental treatments within classes. Cases were randomly dropped from the analysis to achieve equal cell sizes (n = 10 per cell).

Design and Procedures

A 2 x 2 x 2 factorial design was used; factors one and two were learning and retention treatments (superordinate or co-ordinate topic sentences); factor three was grade level. Classes were randomly divided into two groups with one group being taken to another room, the other remaining in class. This procedure was counterbalanced across treatments. After an introductory talk, accompanied by slides, Ss were given a lesson on howler monkeys previously used by Gagné and Weigand (1970) consisting of 25 sentences presented one sentence at a time. These materials were revised somewhat from the original set (kindly provided by Professor Gagné) in order to "tighten" (or make stronger, in our opinion) the superordinate relationships. Each sentence (fact) was projected on a screen, and also read to the Ss. The Ss were then instructed to fill in a blank in the same sentence appearing in a booklet in front of them (one sentence per page). The sentence was re-read to the Ss with the word "blank" being used where appropriate. The total interval from one sentence to the next was 15 seconds. (See Gagné and Weigand (1970) for details of this procedure.)

Superordinate and co-ordinate earning treatments differed in two ways. Before each set of five slides, a blank slide appeared on the screen for five seconds. During this interval in the superordinate condition, E said, "This sentence tells what the next few are all about," and a sentence which presumably organized the next four sentences, followed. In the co-ordinate condition, E said, "The next few sentences go together," and a sentence with a fact parallel to the next four, followed. All sentences other than the superordinate or co-ordinate sentence were identical in all conditions.

Two days later, at approximately the same time of day, the Ss were reassembled in two groups for retention sessions. The Es had preselected five facts to be tested for retention (positioned two slides after the superordinate or co-ordinate sentence in each set of five). Retention was measured by means of a five page booklet, each page containing four sentences with one key word omitted. One of the sentences on each page was a paraphrase of the fact to be remembered, the other three misleads. Ss were to check the fact sentence they had seen before (recognition) and were then to fill the blank in that sentence (recall) (See Gagné and Weigand, 1970). In topic sentence retention groups, Ss were read the superordinate sentence relevant to each page before they made their choice; in other groups they were read nothing. Recognition of the other facts was measured with a true-false test (administered last) containing paraphrased versions of the facts.

Results

Separate analysis were conducted on recognition, verbatim recall given recognition, recall given recognition with synonyms allowed, and

true false scores. The true-false test showed no interesting significant effects and will not be discussed. Recognition and recall given recognition with synonyms allowed show identical results: significant ($p < .05$) main effects for topic sentence at retention and grade, and a significant interaction between topic sentence at learning x topic sentence at retention. When synonyms are not counted for recall the trend of the data are in the same direction as the above two analyses but only topic sentence at recall reaches significance.

Contrary to the Gagné and Weigand (1970) findings, presence of a topic sentence at retention resulted in significantly lower recognition and recall of facts than no topic sentence. The significant interaction indicates that this effect is most pronounced when the topic sentence was present during learning. Table 1 shows the mean recognition scores for

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Insert Table 1 about here

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the four experimental treatments and the nature of the interaction. Another way of stating this result is that the condition most conducive to learning was topic sentence present at learning, absent at recall.

With respect to grade, fifth graders generally do better than third graders but there is no evidence for the developmental differences suggested by Gagné and Weigand (1970).

Discussion

No reason is immediately apparent for the differences in findings between the present experiment and Gagné and Weigand (1970). Although

the materials and procedures used in the two experiments were not identical, the differences do not appear large enough to account for the discrepancy. Gagne and Weigand (1970) interpreted their data to indicate the locus of the organizing effect of a superordinate context at the retrieval stage of information processing, rather than the storage phase. Our data lead up to a somewhat different, more complex conclusion. The specific organizational contexts provided by the Es did not seem to be the key factor operating to influence retention. Rather, the topic sentences may serve as a cue to S to organize. This cue or set is most facilitatative when, at retention, Ss are allowed to use their own retrieval cues rather than the ones externally imposed by E. The imposed topic sentences appeared to disrupt rather than facilitate retention at the time of the retention test. The data imply that youngsters of this age group may process information more effectively if, once given organizational sets, they are allowed to devise and utilize their own organizers.

Bruning (1970) has conducted an experiment with many similarities to the present experiments and he too failed to find specific effects at learning for superordinate topic sentences. It is possible that teaching Ss to search for superordinate relationships within materials will prove more productive than attempting to structure materials to follow certain sequences. The literature on sequence in instruction is filled with inconsistencies and anomalies such as the one observed here. The issue awaits a more adequate depiction of what Ss actually do, the processes they utilize in dealing with various types and versions of instructional materials.

Table 1

Mean Recognition Scores

		Topic Sentence at Recall	
		Yes	No
Topic Sentence at Learning	Yes	2.50	3.95
	No	2.95	3.00

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